Depressive Symptoms and Consequences of Alcohol Use in Undergraduates

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Abstract

This study investigated the association between depressive symptoms in relation to positive and

negative consequences of alcohol use. It was hypothesized that positive and negative

consequences of alcohol use would positively correlate with depressive symptoms. The sample

consisted of 402 undergraduate students (76.1% female), with an average age of 21 years.

Depressive symptoms were positively correlated with positive and negative consequences of

alcohol use. Feelings of sadness (dysphoria), lack of interest (anhedonia), changes in

appetite, sleep disturbances (insomnia/ hypersomnia), difficulty thinking/concentrating,

feelings of guilt (worthlessness), excessive tiredness (fatigue), movement changes

(psychomotor agitation/ retardation), and suicidal ideation, predicted negative consequences

of alcohol use. Depressive symptoms predicted positive consequences of alcohol use.

Suicidal ideation was found to not be a predictor of positive consequences. Positive and

negative consequences of alcohol use predicted depressive symptoms, with the exception of

positive consequences predicting suicidal ideation. Age resulted a negative relationship with

changes in appetite and positive consequences of alcohol use. The results from this have

implications for alcohol prevention and early intervention programs directed towards

depressive symptoms and the consequences of alcohol use.

Depressive Symptoms and Consequences of Alcohol Use in Undergraduates

Alcohol use is considered a normative part of attending a post secondary institution, with 86% of undergraduates consuming alcohol at least once in the past 30 days (Centre for Addiction and Mental Health, 2008). With frequent and heavy alcohol use, problematic drinking patterns start to emerge. For example, 72.1% of university students (aged 19-24) engaged in heavy episodic drinking (at least once) in the past 12 months (Centre for Addiction and Mental Health, 2002). Heavy episodic drinking is defined as the consumption of four or more drinks for females, or five or more drinks for males, on one occasion (Leichliter, Meilman, Presley, & Cashin, 1998). There is growing concern for heavy episodic drinking among the undergraduate population, with undergraduates exhibiting higher heavy episodic drinking rates when compared to the general population (Wechsler et al., 2002)

The more one engages in alcohol consumption, the more likely one is to experience positive and negative consequences (Sadava & Pak, 1993). Negative consequences include personal injuries, struggles with academics, unplanned sexual activity, and legal problems (Perkins, 2002). Previous research has fixated on the negative aspects of physical, social, and behavioural consequences (Lee, Maggs, Neighbors, & Patrick, 2011). The majority of positive consequences involve a subjective outcome, such as relaxation effects and enjoyment (Lee et al., 2011). Although positive consequences have been less investigated, they are reported as more significant than negative consequences, reinforcing expectations of alcohol use (Park, 2004).

While many consider attending a post secondary institution a positive experience, it comes with increased rates of depression and other mental health problems (Geisner, Mallett, & Kilmer, 2012). Depressive symptoms and problematic drinking are related in forms of coping with depression (Grant, Stewart, & Mohr, 2009) and depressive symptoms being the

consequence of problematic drinking (Schuckit, 2006). The relationship between positive consequences and depressive symptoms is less understood (Park, 2004).

Individual Differences

Individual difference variables such as age and sex are associated with alcohol-related consequences (SAMHSA, 2006). Different age groups are more dominant in heavy drinking; for example, individuals aged 17-23 years old experience higher rates of heavy episodic drinking when compared to any other age group (Gill, 2002). Students who are underage report more problems associated with alcohol use, such as doing something they regret and getting in trouble with the police (Wechsler et al., 2002). The influences of age are also shown in undergraduates as they "mature out of" heavy drinking and accept adult responsibilities (Marlatt & Baer, 1997).

Sex differences have been shown in alcohol use and alcohol use consequences. Men engage more frequently in heavy episodic drinking (Centre for Addiction and Mental Health, 2002), but women develop more problems related to this behaviour (Vicary & Karshin, 2002). The difference in physical health between women and men leave women more affected by the substance in a shorter period of time, as well as not being able to consume the same amount as men, leaving them more susceptible to alcohol-related problems (Wechsler, Nelson, & Weitzman, 2000).

Consequences of Alcohol Use

Frequent alcohol use results in a variety of adverse psychological and physical consequences. Negative consequences occur during or in close proximity to drinking, or can lead to long-term consequences. Those engaging in heavy drinking patterns experience more negative alcohol-related consequences including, psychological, social, and behavioural problems (Fenzel, 2005). For instance, 92% of heavy drinkers reported becoming emotionally unstable due

to drinking, 86% reported it interfered with school, and 72% reported aggressive behaviour due to alcohol (Fenzel, 2005). Undergraduates drinking to the point of intoxication develop impairments in cognitive ability (decision making, impulse control, and impairments in motor function; White & Hingson, 2014). For example, those who drank to the point of intoxication once a week reported a higher likelihood of being injured, experiencing falls that require medical treatment, causing injury in traffic crashes, being taken advantage of sexually, and injuring others in various ways (O'Brien et al., 2006). Undergraduates who engage in heavy drinking place themselves and others at a higher risk of experiencing negative consequences.

Secondary consequences happen to abstainers and nondrinkers due to undergraduates' engagement in alcohol use. These consequences have contributed to an increase in fights, arguments, vandalism, physical assaults, and unwanted sexual advances (Bishop, 2000; Clapp, Shillington, & Segars, 2000; Wechsler et al., 2000). Secondary consequences increase academic difficulty among undergraduates by disrupting sleep patterns and study habits (Rhodes et al., 2009). Drinking patterns can influence the amount of secondary consequences that occur on campus. For instance, secondary consequences were more prominent in universities with severe heavy episodic drinkers than universities with greater amounts of abstainers (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). Therefore, undergraduates' alcohol use and the consequences do not only affect those engaging in the behaviour, but also create health and social problems for those around them.

Positive consequences also occur as a result of alcohol use, occurring during or in close temporal proximity to alcohol consumption. They reoccur more frequently and have more extreme effects when compared to negative consequences (Park, 2004). Undergraduates perceive them as having beneficial effects, such as social and image enhancement (Park, 2004). These

effects downplay the seriousness of consequences, even when they are clinically significant (Colby, Swanton, & Colby, 2012). They perceive the negative consequences to be offset by the positive effects (Colby et al., 2012), reinforcing positive expectations of alcohol use (Park, 2004). Undergraduates are motivated to experience positive consequences rather than avoiding negative ones (Park, 2004).

Depressive Symptoms in Undergraduates

Alcohol use and depressive symptoms are shown to co-occur in the adult population (Martens et al., 2008). Depressive symptoms include feelings of sadness (dysphoria), lack of interest (anhedonia), changes in appetite, sleep disturbances (insomnia/hypersomnia), difficulty thinking/concentrating, feelings of guilt (worthlessness), excessive tiredness (fatigue), movement changes (psychomotor agitation/retardation), and suicidal ideation (Weis, 2014). Undergraduates face new challenges during the transition to university, allowing for psychological problems and depressive symptoms to emerge in the first year (Jackson & Finney, 2000). Some develop coping strategies for stress and try to adapt to the new environment (Dyson & Renk, 2006). Therefore, many undergraduates experiencing depressive symptoms will resolve these symptoms on their own, but some may develop lasting patterns (Geisner et al., 2012).

Depressive symptoms are related to problematic drinking (Grothues et al., 2008). For example, undergraduates experiencing depressive symptoms tend to drink alone or in an intimate context, leaving them at higher risk for problematic drinking (Keough, O'Connor, Sherry, & Stewart, 2015). Depressive symptoms can range in severity depending on total intake. For instance, current drinkers engaged in higher total drinking experienced greater severity of depressive symptoms compared to non-drinkers (Geisner et al., 2012).

There are at least three types of models developed to conceptualize interrelations of depressive symptoms and heavy episodic drinking. Vulnerability models position depressive symptoms as occurring prior and contributing to heavy episodic drinking (Khantzian, 1997). These theories are understood to precipitate self-medication alcohol use in order to cope with negative emotions (Khantzian, 1997). They suggest people drink alcohol for the negative reinforcing properties, such as relieving pain (Stewart & Conrod, 2008) or reducing self-awareness (Baumeister, 1991) in order to cope with the feeling of depression. Depressive symptoms are often considered a vulnerability factor influencing heavy episodic drinking (Chassin, Pitts, & Prost, 2002). This was shown in individuals who reported riskier alcohol use as well as drinking to avoid or relieve negative emotional states (Grant et al., 2009).

Depressive symptoms can be conceptualized as consequences of heavy drinking, rather than contributing to problem; these are termed the complication/scar models (Schuckit, 2006). Complication models emphasize only short-term increases in depressive symptoms due to heavy episodic drinking, while scar models view depressive symptoms as more permanent and long lasting (Bagby, Quilty, & Ryder, 2008). Heavy episodic drinking (estimated by frequency of intoxication, hangovers, and alcohol-induced pass-outs) predicts depressive symptoms in participants (Beck, Steer, & Gerbin, 1988). These depressive symptoms can happen immediately after the event or can be experienced with a delayed reaction. An example of immediate and delayed reaction was reported by Birnbaum, Taylor, and Parker (1983); in this study women reported that their consumption of two or more drinks (during one session) was related to mild depressive symptoms (during the actual experiment and the next morning). The consequences of heavy episodic drinking increase subsequent depressive symptoms (Swendsen & Merikangas, 2000). Patients entering an alcohol treatment program ceased drinking and depressive symptoms

took a favorable course, suggesting the symptoms were more likely a consequence rather than a cause (Nakamura, Overall, Hollister, & Radcliffe, 1983). This model recognizes depressive symptoms as an aftereffect of alcohol consumption, allowing for the consequences of alcohol use to have an influence on depressive symptoms.

The reciprocal relations model views heavy episodic drinking and depressive symptoms as being able to influence one another (Mushquash et al., 2013). Depressive symptoms and heavy episodic drinking are seen as co-occurring variables where changes in one can result in changes in the other (Mushquash et al., 2013). This presents depressive symptoms as contributing to heavy episodic drinking, as well as heavy episodic drinking contributing to depressive symptoms (Stewart, Grant, Mackie, & Conrod, in press). This model displays a bidirectional influence on both factors, allowing for the causal factors to go both ways.

Depressive Symptoms and Consequences of Alcohol Use

Heavy episodic drinking and depressive symptoms are related, for example, heavy episodic drinking resulted in reduced general physical well-being (fatigue and sleeping problems) and depressive symptoms (Arria, Dohey, Mezzich, Bukstein, & Van Thiel, 1995). Cross-sectionally, sadness, fatigue, irritability, and sleep problems, related to heavy episodic drinking (Archie, Zangeneh Kazemi, & Akhar-Danesh, 2012). Undergraduates with higher depressive symptoms do not drink more than other students, but they do report experiencing more negative consequences from alcohol use (Martens et al., 2008). This creates a relationship between depressive symptoms and alcohol-related negative consequences (e.g., missing class, getting into trouble with authorities, or becoming ill as a result of drinking alcohol) in undergraduates.

Psychological variables have an association with and positive and negative consequences. For example, psychological variables influence consequences by avoiding negative ones or creating vulnerabilities to experience greater amounts of alcohol-related problems (Sadava & Pak, 1993). Constructive thinking, defined as a style that involves appraising and approaching situations with adaptive reasoning and controlling negative emotions allowing for appropriate problem-solving skills to emerge (Epstein &Meier, 1989), has been related to consequences of alcohol use. For example, those who exhibit higher constructive thinking experienced fewer negative consequences, suggesting constructive thinking acts as a protectant against negative consequences (Park & Grant, 2005). Depressive symptoms can also create vulnerability towards consequences of alcohol use, using alcohol to relieve a negative state and enhance emotions (Cooper, Frone, Russell, & Mudar, 1995). For example, positive expectancies and beliefs of alcohol use are related to higher levels of positive and negative consequences (Park & Grant, 2005).

Negative affect is moderately linked to positive and negative consequences of alcohol use (Park & Grant, 2005). For example, students with poorer adjustment skills (i.e., participants with higher negative affect) are related to experiencing more negative consequences of alcohol use (Camatta & Nagoshi,1995). Undergraduates hold positive expectancies for alcohol intake, allowing for positive beliefs about the consequences of alcohol use (Park & Grant, 2005). The consequences of alcohol use can also induce depressive symptoms. For example, when predicting depressive symptoms over a 5-year period, the best predictor was the frequency of hangovers (Paljärvi et al., 2009). The direction of causation for consequences and depressive symptoms is less clear, as well as the specific depressive symptoms that contribute towards it (Paljärvi et al., 2009; Mushquash et al., 2013).

Gaps In Literature

Past literature has found negative and positive consequences of alcohol use to be related to psychological variables in undergraduates (Park & Grant, 2005). Understanding whether depressive symptoms are differentially associated with positive and negative consequences of alcohol use is critical to accurately conceptualizing, assessing, and treating undergraduates who experience depressive symptoms and consequences of alcohol use. Undergraduates may engage in drinking to cope with these depressive symptoms, or the consequences of alcohol use may precede depressive symptoms. Cross-sectional analysis indicated negative consequences from alcohol use result in an increase in depressive symptoms, this may contribute to problematic alcohol use leading back to the negative consequences (Dvorak, Lamis, & Malone, 2013). Undergraduates experiencing depressive symptoms are expected to use drinking as a coping mechanism and deal with negative affect, resulting in positive consequences (Park & Grant, 2005).

Less is known about the contribution of depressive symptoms towards consequences of alcohol use specifically (Mushquash et al., 2013). The bidirectional influence needs further investigation in order to understand and prevent depressive symptoms and consequences. Past research has addressed the need in assessment programs to reduce alcohol-related problems (Fenzel, 2005). In order to address this issue, depressive symptoms need to be identified in order to understand what variables are highly associated with positive and negative consequences. More research is needed in order to further examine the underlying mechanisms and future mental health problems (Dvorak et al., 2013).

The goal of the present study is to extend previous work by investigating the relationship between depressive symptoms and negative consequences of alcohol use, while adding to limited

research on positive consequences (Park, 2004). Students with higher levels of depressive symptoms did not drink more than other students, but reported experiencing more negative consequences as a result of alcohol use (Martens et al., 2008). This study aims to clarify the specific depressive symptoms related to positive and negative consequences of alcohol use. By establishing these effects and the direction of influence, there is a potential in preventing and understanding depressive symptoms and the positive and negative consequences of alcohol use.

Hypotheses

The current study will examine the relationship between depressive symptoms and positive and negative consequences of alcohol use. It is hypothesized that negative consequences will be positively correlated with the depressive symptoms. Further, positive consequences will positively correlate with depressive symptoms.

Method

Participants

This study consisted of 402 undergraduate psychology students (76.1% female, 23.9% male) from Lakehead University. The mean age of this sample was 20.9 ($SD = 4.4$), with most participants in their 3rd year of study at Lakehead University (32%). In order for students to be eligible to participate they were required to be fluent in English, be at least 18 years of age, and have consumed at least one drink of alcohol in the past 3 months. Forty-one percent of the sample reported having four or more drinks containing any kind of alcohol, within a two-hour time period, in the past seven days.

Procedure

Lakehead University participants were recruited using flyers, announcements, and e-mails in undergraduate psychology courses. Students were informed they may obtain one bonus

point towards a psychology course or be entered into a draw for $100. Participants who were willing to participate in the study were directed to the online survey on SurveyMonkey that took approximately 45 minutes to complete. A letter of consent was presented to the participant before the survey began, addressing the potential risks and benefits of the study. It also informed the participant they may choose not to answer a question, and/or withdraw from the study at any time without penalty (i.e., not losing the bonus point). When participants read over the terms of agreement, they then clicked the "I consent to participate" button, directing them to the online questionnaires. The survey contained multiple questionnaires that addressed demographics, alcohol consumption, and consequences of alcohol use. After they survey was completed, a page of debriefing was displayed and the participants were thanked for their time. The Research Ethics Board of Lakehead University approved this study.

Measures

Demographic information. The demographic questionnaires collected information regarding age, gender, ethnicity, overall course average, and current year in university.

Alcohol consumption. In order to determine alcohol frequency, participants were asked to report alcohol consumption over the past 90 days (one standard alcoholic drink is defined as one 12 oz. bottle or can of beer or cooler, one 5 oz. glass of wine, or one shot of hard liquor or spirit; Stewart, Morris, Mellings, & Komar, 2006). Participants were divided into those who are drinkers (consumed at least one drink in the past 3 months) and those who are non-drinkers (have not consumed at least one drink in the past 3 months). Participants who drank were asked to report how often they drank (e.g., four or more drinks on one given occasion), allowing for distinction between certain drinking patterns (e.g., heavy episodic drinking). Participants were

asked to record the greatest number of drinks (in the past seven days) that they consumed within a two-hour period, in order to determine the amount of alcohol being consumed.

The Alcohol Use Disorder Identification Test (AUDIT). The AUDIT was created to assess problems related to drinking by looking at individuals who consume alcohol compared to those who do not (Saunders, Aasland, Amundsen, & Grant, 1993; Saunders, Aasland, Babor, De La Fuente & Grant, 1993). It was developed to identify individuals who had problems drinking and would benefit from reducing their alcohol consumption (Saunders et al., 1993). Questions range from 0 ("never") to 4 ("4 or more times a week") and ask questions such as, "How often do you have a drink containing alcohol?" in order to determine frequency of alcohol consumption. It covers the domains of alcohol consumption, drinking behaviour, and alcohol-related problems (Saunders et al., 1993). A score of 8 or more for men (7 or more for women) indicates harmful alcohol consumption, and a score of 20 or more indicates alcohol dependence (Saunders et al., 1993). It has been widely used in undergraduate populations (Aertgeerts et al., 2000; Clements, 1998). The 10-item scale demonstrates high test-retest reliability as well as high internal consistency (Cronbach's α = .94; Meneses-Gaya, Zuardi, Loureiro, & Crippa, 2009).

The Positive Drinking Consequences Questionnaire (PDCQ). The PDCQ is used to assess the frequency of positive consequences of drinking (Corbin, Morean, & Benedict, 2008). It consists of 14-items that range from "0" to "<10". Participants indicate the number of times that they have experienced the consequences listed (in the past 3 months). It represents good internal consistency, (Cronbach's α = .88; Corbin et al., 2008), and split-half reliability (r = .80, p < .01; Corbin et al., 2008). This measure has been associated with more severe drinking behaviour that results in negative consequences, suggesting that increases in alcohol use frequency can lead to positive and negative consequences (Corbin et al., 2008). It has been used

to relate the effect of positive consequences with predicting heavy episodic drinking through multiple regression analysis (Corbin et al., 2008).

Center for Epidemiological Studies of Depression Scale – Revised (CESD-R). In epidemiological research, the original Center for Epidemiological Studies of Depression (CESD; Radloff, 1977) was one of the most widely used measures (Eaton, Muntaner, Smith, Tien, & Ybarra, 2004). The CESD-R was constructed from the CESD to create a 20-item measure that reflected criteria for depression in the DSM-IV (Eaton et al., 2004). It measures the depressive symptoms of feelings of sadness, loss of interest, changes in appetite, sleep disturbances, difficulty in thinking/concentration, feelings of guilt, tiredness (fatigue), movement changes, and suicidal ideation**.** By summing all the responses to each question it determines the total score, allowing for participants to be categorized (e.g., meets criteria for major depressive episode). It has been administered to a large community sample (n = 7389), as well as a small undergraduate sample (n = 245). Both samples showed significant internal consistency (Cronbach's $\alpha > 0.91$). The internal consistency for undergraduates resulted in significant results (Cronbach's $\alpha = 0.93$) and had high convergent and divergent validity between the CESD-R and the STICSA, $r = 0.65$, $p < 0.01$ (Van Dam & Earleywine, 2011). Convergent and divergent validity were demonstrated when the instrument was compared to anxiety and positive and negative affect (Van Dam & Earleywine, 2011). It is an accurate and valid measure of depression using a large sample of the community, as well as a small sample of undergraduate students.

Results

One hundred and forty-five participants (44%) reported consuming an alcoholic beverage 2-4 times a month. The average participant consumed 3-4 drinks on a typical day when drinking ($SD = 1.12$), with a range of one to 10 or more drinks. Two hundred and sixty participants (79%)

reported consuming five or more drinks on one occasion (weekly, monthly, or less than monthly). In the past seven days, 41% of participants reported consuming four or more alcoholic drinks within a two hour time period ($M = 1.69$, $SD = 1.12$).

In the past year, 8% of participants experienced injury to themselves or others because of alcohol ($M = .53$, $SD = 1.19$). During the last year, 24 participants (7.3%) reported feeling guilt or remorse after drinking and 35 (10.7%) reported being unable to remember what happened the night before because of drinking. During the past month, because of alcohol, 105 participants (31.8%) reported making others laugh and 104 participants (31.6%) found it easier to make conversation.

The CESD-R scale was analyzed and the most frequently endorsed depressive symptoms for the past week included sleep disturbances ($M = 2.64$, $SD = 2.40$), feelings of sadness ($M = 2.09$, $SD = 2.80$), and difficulty concentrating ($M = 1.81$, $SD = 1.93$). From these frequently endorsed depressive symptoms (experiencing each for at least 1-2 days in the past week), 124 (38%) reported feeling sad, 120 (36.6%) reported restless sleep, and 118 (36%) had difficulty concentrating. Suicidal ideation and appetite were less frequently endorsed ($M = .39$, $SD = 1.26$ and $M = .74$, $SD = 1.15$, respectively). Rating symptoms in in the past week (experiencing each for at least 1-2 days) only 22 (6.7%) lost weight without trying and 13 (4%) wanted to hurt themselves.

Relationships with Depressive Symptoms

Associations between depressive symptoms and consequences of alcohol use were first examined (see Table 1). Negative consequences were measured using the AUDIT alcohol-related problems subscale. Significant positive associations were evident between alcohol-related problems and sadness ($r = .33$, $p < .01$), sleep ($r = .27$, $p < .01$), fatigue ($r = .31$, $p < .01$), loss of

interest ($r = .27, p < .01$), appetite ($r = .19, p < .01$), concentration ($r = .35, p < .01$), guilt ($r = .32, p < .01$), movement ($r = .26, p < .01$), and suicidal ideation ($r = .23, p < .01$). Significant positive associations were evident between positive consequences and sadness ($r = .23, p < .01$), sleep ($r = .21, p < .01$), fatigue ($r = .24, p < .01$), loss of interest ($r = .17, p < .01$), appetite ($r = .20, p < .01$), concentration ($r = .23\ p < .01$), guilt ($r = .17\ p < .01$), movement ($r = .25, p < .01$), and suicidal ideation ($r = .16, p < .01$).

Consequences of Alcohol Use Predicting Depressive Symptoms

Multiple linear regression analyses were performed to analyze the relationship between depressive symptoms and consequences of alcohol use, while controlling for age and sex. Depressive symptoms were examined in terms of predicting positive and negative consequences, as well as the consequences predicting the various depressive symptoms. In the models predicting negative consequences and positive consequences each depressive symptom was entered and compared separately, allowing for the variance to be accounted for in each depressive symptom. In the multiple regression analyses, age was entered in step 1 and sex was entered at step 2. Each individual subscale of depressive symptoms (feelings of sadness, lack of interest, changes in appetite, sleep disturbances, difficulty thinking/concentrating, feelings of guilt, excessive tiredness, movement changes, and suicidal ideation) was entered separately at step 3. Results of the various depressive symptoms predicting negative and positive consequences are presented in Tables 2-10. All nine depressive symptoms significantly predict negative consequences of alcohol use. Suicidal ideation is the only depressive symptom that did not predict positive consequences of alcohol use. Age yielded significantly negative results when predicting changes in appetite and positive consequences of alcohol use.

In order to examine to association between negative and positive consequences of alcohol use multiple regression analyses included age in step 1, sex in step 2, and positive and negative consequences of alcohol entered separately at step 3. Negative consequences of alcohol use significantly predicted all nine depressive symptoms; these results are displayed in Table 11. Positive consequences of alcohol use predicting depressive symptoms are displayed in Table 12. Positive consequences significantly predicted all depressive symptoms with the exception of suicidal ideation.

Discussion

Heavy episodic drinking in undergraduates is associated with a multitude of negative consequences (Fenzel, 2005) and positive consequences (Park, 2005). Depressive symptoms are identified as one of the consequences of heavy episodic drinking (Schuckit, 2006), but are also identified as a vulnerability factor contributing towards them (Chassin et al., 2002). With alcohol use being widespread among undergraduates, it is important to understand the relationship between depressive symptoms and consequences of alcohol use in order to conceptualize and treat undergraduates who experience depressive symptoms. The current study examined both the positive and negative consequences of alcohol use and depressive symptoms among undergraduates. Consistent with our first hypothesis, the present study found significant positive correlations between consequences of alcohol use and depressive symptoms. Negative consequences and depressive symptoms yielded significant positive correlations; that is, participants who experienced a greater frequency of depressive symptoms experienced a greater frequency of negative consequences, and the less frequent depressive symptoms were associated with fewer negative consequences. These findings are consistent with the literature, which associates depressive symptoms directly with alcohol-related negative consequences (Martens et

al., 2008). Past research has found correlations of .22-.32 between depressive symptoms and problems with alcohol (Camatta & Nagoshi, 1995; Nagoshi, 1999; Patock-Peckham, Hutchinson, Cheong, & Nagoshi, 1998). The current study yielded similar findings, reporting bivariate correlations of .19-.33 between depressive symptoms and negative consequences.

Consistent with our second hypothesis, the current study found significant positive correlations between depressive symptoms and positive consequences of alcohol use. This finding suggests that undergraduates experiencing a greater frequency of depressive symptoms also experience a higher number of positive consequences from their alcohol use. This is consistent with previous studies, stating psychological factors yield promising results regarding positive consequences (Park & Grant, 2005). The present study examined each individual subscale of the CESD-R in order to compare associations between individual depressive symptoms and consequences of alcohol use. The CESD-R subscales include feelings of sadness (dysphoria), lack of interest (anhedonia), changes in appetite, sleep disturbances (insomnia/ hypersomnia), difficulty thinking/concentrating, feelings of guilt (worthlessness), excessive tiredness (fatigue), movement changes (psychomotor agitation/ retardation), and suicidal ideation (Eaton et al., 2004). Further analyses were conducted in order to understand the relationship between depressive symptoms and consequences of alcohol use. There is a known relationship between depressive symptoms and alcohol use (Paljarvi et al., 2009; Mushquash et al., 2013) but the relationship between depressive symptoms and negative and positive consequences of alcohol have been less investigated. Multiple linear regression analyses were performed to identify the relationship between depressive symptoms and positive and negative consequences of alcohol use. Specific depressive symptoms were examined individually. Age and sex were controlled for in each regression due to previous literature stating their associations

with consequences of alcohol use (Centre for Addiction and Mental Health, 2002). These controls were used to account for false relationships between depressive symptoms and consequences of alcohol use.

All depressive symptoms significantly predicted negative consequences; that is, the greater frequency in depressive symptoms predicted greater frequency in negative consequences. In the present study, negative consequences also predicted depressive symptoms among undergraduates; that is, the more frequently undergraduates experienced negative consequences the more frequent depressive symptoms were reported. These results indicate a strong positive relationship between depressive symptoms and negative consequences of alcohol use. Our results are consistent with past literature, suggesting depressive symptoms as a vulnerability factor for heavy episodic drinking (Chassin et al., 2002) as well as considering negative consequences as increasing depressive symptoms (Swendsen & Merikangas, 2000). The findings contribute to literature by establishing a strong positive relationship between depressive symptoms and negative consequences. These findings replicated previous findings associating depressive symptoms with heavy episodic drinking (Khantzian, 1997; Stewart & Conrod, 2008; Bagby et al., 2008; Paljarvi et al., 2009; Schuckit, 2006). The present study expanded these findings by identifying which depressive symptoms displayed the strongest relationship with negative consequences; that is, what depressive symptoms displayed the most frequency with greater amounts of negative consequences. Individuals' experiences of difficulty in concentration, feelings of sadness, and feelings of guilt resulted in the strongest relationship with negative consequences. Difficulty in concentration displayed the strongest significant relationship with negative consequences; that is, individuals experiencing frequent difficulty in concentration experienced higher levels of negative consequences. This may be due to

participants not being able to exhibit constructive thinking when engaging in alcohol use (Park & Grant, 2005). Constructive thinking acts as a protectant against negative consequences of alcohol use by engaging in problem-solving actions (Park & Grant, 2005). When individuals have difficulty concentrating they may not be able to engage in constructive thinking, decreasing the ability to appraise and approach situations with reason and control. This may lead undergraduates to not planning ahead and not concentrating on situations, making them more prone to experiencing negative consequences of alcohol use. This may also be due to the experience of negative consequences, with undergraduates being unable to analyze situations they have encountered during intoxication. For example, 62% of students reported having trouble keeping their mind on what they were doing. This difficulty in concentration may be due to negative consequences experienced or other psychological, social, or environmental issues they are experiencing prior to drinking.

Difficulty in concentration may have resulted in a high association with depressive symptoms due to its similarity with characteristics of hangovers. A hangover is considered a negative consequence of alcohol use, which displays similar characteristics in influencing concentration (Slutske, Piasecki, & Hunt-Carter, 2003). With hangovers being the most widely experienced negative consequence of alcohol use (Wechsler et al., 1994; Wiese, Shlipak, Browner, 2000), it may explain the high frequency of difficulties in concentration and negative consequences of alcohol use. The frequency of hangovers successfully predicted depressive symptoms in past studies (Paljarvi et al., 2009). Hangovers may also have the ability to enhance and elongate difficulties in concentration among undergraduates. This finding is important to investigate because it shows that this population of undergraduates who experienced greater frequency in difficulties in concentration also experienced higher amounts of negative

consequences. These difficulties may lead to disruption in concentration, for example, impacting an undergraduates ability to concentrate in lectures and study for exams.

Feelings of sadness resulted in the second strongest relationship with negative consequences, followed by feelings of guilt. These results can be explained by studies addressing the need to relieve pain (Stewart & Conrod, 2008) or reducing self-awareness (Baumeister, 1991). When individuals engage in heavy episodic drinking to relieve feelings of sadness or guilt, it results in a reduction of self-awareness (Hull, 1981). Due to the lack of self-awareness, these undergraduates may not be able to self-evaluate the behaviours they are engaging in. A lack of self-awareness may also result in consuming greater amounts of alcohol and not being able to assess actions during intoxication, leading to greater amounts of negative consequences. Negative consequences of alcohol use may also induce feelings of sadness or guilt (Schuckit, 2006). This may be displayed in undergraduates who experienced injury to themselves or others because of alcohol; that is, undergraduates who hurt a friend due to alcohol may experience guilt or sadness the next day. After undergraduates have experienced negative consequences, they sober up and have to deal with the negative actions they engaged in. With undergraduates demonstrating a strong positive relationship between feelings of sadness and feelings of guilt with negative consequences of alcohol use, it may contribute toward the prevention of negative consequences.

It is important that researchers try to understand the positive experiences of alcohol use. These positive consequences have the ability to contribute to or relieve depressive symptoms and may aid in creating preventative measures against alcohol use. In the current study, we examined the relationship between depressive symptoms and positive consequences. Positive consequences significantly predicted depressive symptoms and depressive symptoms significantly predicted

positive consequences. These findings represent a strong positive relationship between depressive symptoms and positive consequences; that is, undergraduates who experienced greater frequency in depressive symptoms also experienced greater amounts of positive consequences. Future studies should incorporate how positive consequences are subjectively evaluated to gain insight into their contribution towards depressive symptoms. Undergraduates experiencing positive experiences from alcohol (i.e., social enhancement) may return to a depressive feeling once the confidence from alcohol disappears. Undergraduates may rely on alcohol to create these positive consequences by temporarily distracting themselves from emotions and self-critical thoughts (Mushquash et al., 2013). This leads to undergraduates engaging in alcohol use and experiencing positive consequences as coping motives to relieve emotional states (Cooper, 1994). After the consequences have occurred, undergraduates may return to their original negative emotional state. Future studies need to include undergraduates' perceptions of positive consequences and their association with depressive symptoms in order to gain further insight into positive consequences.

Suicidal ideation did not predict positive consequences of alcohol use and positive consequences did not predict suicidal ideation. This may be due to age and sex being controlled for in the multiple regression analyses or may also be due to our measure of suicidal ideation being based on two items measuring symptoms only in the past 7 days. It is possible that some students experienced greater amounts of suicidal ideation in recent weeks or months. Past literature found approximately 61% of college students (in the past month) reported some level of suicidal ideation while the current study found that 14% of undergraduates experienced suicidal ideation (in the past week; Gonzalez, Bradizza, & Collins, 2009). The use of one timeframe measuring depressive symptoms only in the past week represented a very concise

timeframe. Far fewer studies have examined positive consequences with suicidal ideation, suggesting positive consequences may have a different influence than negative consequences. It is possible that people who experience positive consequences experience them for quick fix enhancements, while suicidal ideation is more focused on the negative outcomes associated with drinking (e.g., attempts of suicide due to drinking; Gonzalez et al., 2009). More research is needed in order to understand and expand the relationship between suicidal ideation and positive consequences of alcohol use.

Experiencing difficulty in concentration, feelings of fatigue, sleep disturbances, and movement changes (psychomotor agitation/ retardation), displayed the strongest positive relationships with positive consequences. Levels of fatigue, sleep disturbances, and difficulty in concentration are highly similar to characteristics of a hangover (e.g., exhaustion, dizziness, trouble sleeping; Tolstrup, Stephens, & Grønbaek, 2014). With undergraduates perceiving characteristics of a hangover as beneficial or positive rather then a negative consequence, it may explain the higher frequency in ratings for depressive symptoms that display similar characteristics to hangovers (Mallett, Bachrach, & Turrisi, 2008). This may explain why undergraduates rated these symptoms more frequently when compared to other depressive symptoms that are not perceived as beneficial (e.g., feelings of sadness). A change in movement was also highly associated with positive consequences; that is, those who experienced greater frequency in movement changes experienced greater amounts of positive consequences. This is consistent with previous studies investigating performance enhancement and activity enhancement as positive consequences of alcohol use in undergraduates (Park, 2004). States of over activity may enhance undergraduates' experience during intoxication (e.g., dancing) allowing a perception of these changes to be beneficial. This may explain why students rate

changes in movement more frequently when compared to other depressive symptoms. These findings are important to study in order to understand the frequent and extreme effects of positive consequences. A strong positive relationship between depressive symptoms and positive consequences of alcohol use signifies greater amounts of positive consequences are related with more frequent depressive symptoms. By identifying the depressive symptoms with the greatest association it allows for greater expansion in intervention based settings and treatment programs. They can be modified to focus on difficulty in concentration, feelings of fatigue, sleep disturbances, and movement changes in order to understand the relationship with positive consequences. Currently interventions are based primarily on negative consequences and future studies should incorporate positive consequences as well (Park & Grant, 2005).

When performing multiple linear regression analyses, age resulted in significantly negative results for predicting appetite; that is, younger participants experienced a greater frequency in change in appetite compared to older aged participants. This may be due to younger individuals engaging in heavy episodic drinking more frequently, while older individuals who engage in heavy episodic drinking do so at a lesser intensity and experience fewer consequences (Tolstrup et al., 2014). This finding can also be explained by greater drinking experience with older participants developing a higher tolerance to the effects of alcohol, allowing their appetite to be less affected by the consequences of alcohol (Tolstrup et al., 2014).

Age also yielded significantly negative results when predicting positive consequences of alcohol use; that is, younger individuals experienced higher levels of positive consequences of alcohol use. This may be due to younger participants engaging in alcohol use as a social and positive experience. Many undergraduates hold positive expectations for alcohol use, reinforcing the positive consequences they experience from it (e.g., social enhancement). With alcohol use

being a normative part of attending university (Chen & Kandel, 1995), it allows for younger

individuals to perceive drinking as a beneficial experience. As individuals age the desirable

outcomes of alcohol use changes; for example, younger students may drink for social aspects

experiencing many positive consequences, while older individuals may drink to cope or because

of a developed addiction, resulting in fewer positive consequences (Leigh & Stacy, 2004).

Limitations, Future Research, and Implications

Although the current study provided insight into the relationship between positive and

negative consequences of alcohol use and depressive symptoms, there are limitations present.

The majority of this sample consisted of educated female undergraduate students. This creates a

limitation with males reporting more negative consequences than women (Park & Grant, 2005).

Future studies should incorporate a more representative sample in order to be applied to the

general population. The present study used self-report questionnaires to report depressive

symptoms and consequences of alcohol use. These self-report measures may be inaccurate

measures of the participant's evaluation of their own depressive symptoms and consequences of

alcohol use. These may result in inaccuracies if undergraduates have lack of insight or are not

able to accurately recall prior events. They may also rate the frequency of items based what they

consider to be the social norm. Daily diaries would be suggested for future studies in order to

examine the immediate effects and feelings related to experiences. The subjective nature of

assessing alcohol consequences and depressive symptoms creates a limitation to the study. There

is a possibility that individuals evaluating behaviours or depressive symptoms perceive them

differently based on a variety of factors or circumstances. In the current study, the PDCQ does

not evaluate perceptions of positive consequences but rather the frequency that an individual has

experienced each, leaving room for differing perceptions. Future research should be directed at

analyzing students' perceptions and not just the frequencies of positive and negative

consequences in order to fully understand the relationship. There is variability in the nature and

course of depressive symptoms (Chen, Eaton, Gallo, Nestadt, & Crum, 2000) creating limitations

to the single time period that was assessed in this study. In order to examine the pathways of

depressive symptoms and the reciprocal influence, a longitudinal study should be performed to

assess depressive symptoms and consequences of alcohol use over time. A longitudinal study

would also offer insight into the cumulative effects depressive symptoms may contribute to the

relationship with consequences of alcohol use. Studying depressive symptoms at one point in

time ignores the fact that these symptoms may change over time depending on whether or not the

individual had recently experienced positive and negative consequences. The CESD-R

timeframe only accounts for the past 7 days, leaving room for fluctuation in depressive

symptoms. The CESD-R subscales were used to assess different depressive symptoms. After

breaking the scale into subscales, each subscale included only two or three questions to measure

each depressive symptom. This creates a limitation in the experience of depressive symptoms;

more questions should be administered in order to fully capture the frequency of each symptom.

A subscale of the AUDIT was used to assess negative consequences of alcohol use due to the

similarity in timeframe with the PDCQ. By using the alcohol-related subscale it created a

limitation by only having four questions addressing negative consequences. Future studies

should incorporate a scale that includes a variety of questions in order to understand the range of

negative consequences within a shorter timeframe.

      The current study found associations between depressive symptoms and the frequency of

positive and negative consequences of alcohol use. The greater frequency of depressive

symptoms was related to increased frequencies of positive and negative consequences. Studies

should be directed towards focusing on the perceptions of consequences of alcohol use in order to better understand the contributions and outcomes related to these consequences. Although the present study found depressive symptoms and consequences of alcohol use to be related, future studies should investigate depressive symptoms and negative and positive consequences over an extended period of time in order to understand the bi-directional influence. Future research examining the relationship between depressive symptoms and the perceptions of alcohol use may strengthen the understanding between depressive symptoms and positive and negative consequences of alcohol use.

These findings can help inform prevention and intervention programming for undergraduates experiencing depressive symptoms as well as positive and negative consequences of alcohol use. With relations between depressive symptoms and consequences of alcohol use, it suggests a reduction in depressive symptoms may coincide with a reduction in negative and positive consequences. Current programs are dedicated mostly towards the reduction of alcohol use and negative consequences (Park & Grant, 2005) but the current study informs relations between positive consequences and depressive symptoms as well. Programs designed to reduce depressive symptoms may benefit from incorporating positive consequences in order to understand undergraduates' expectations of alcohol use. By doing so, undergraduates can relate and balance where they have specific costs and benefits related to this behaviour (Block, 2002). Identifying individual depressive symptoms that correlate with positive and negative consequences of alcohol use may aid in future interventions by being able to emphasize individual depressive symptoms contributing to positive and negative consequences. This may allow for an understanding on how certain depressive symptoms may elevate the risk of experiencing more negative consequences or why undergraduates are experiencing positive

consequences from them. The relationship between depressive symptoms and positive and negative consequences needs to further be examined in order to understand the directional relationship over time.

Conclusion

Although the relationships between depressive symptoms and consequences of alcohol use have been previously investigated, the interplay between them remains unclear. The current study found negative consequences and depressive symptoms to have a significant positive relationship. Negative consequences predicted depressive symptoms, and depressive symptoms predicted negative consequences. While previous literature has focused on the negative consequences of alcohol use and depressive symptoms, it is important to understand positive consequences as well. Positive consequences are very common among undergraduates and understanding their association to depressive symptoms can aid in intervention and prevention programs. The present study found significantly positive correlations between depressive symptoms and positive and negative consequences of alcohol use. This suggests interventions should incorporate depressive symptoms in order to understand the frequency and severity of positive and negative consequences of alcohol use. Furthermore, the generalizability of these findings may be improved with a greater representation of students, as well as conducting longitudinal studies in order to measure the interplay between depressive symptoms and positive and negative consequences of alcohol use.

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Table 1

Bivariate Correlations Between Depressive Symptoms and Consequences of Alcohol Use

	Alcohol-Related Problems	Positive Consequences	Sadness	Sleep	Fatigue	Loss of Interest	Appetite	Concentration	Guilt	Movement	Suicidal Ideation
Alcohol-Related Problems	1	.435**	.327**	.268**	.307**	.269**	.190**	.350**	.322**	.257**	.226**
Positive Consequences		1	.228**	.212**	.243**	.171**	.197**	.232**	.170**	.252**	.156**
Sadness			1	.548**	.660**	.748**	.435**	.629**	.730**	.576**	.616**
Sleep				1	.609**	.485**	.350**	.603**	.480**	.535**	.354**
Fatigue					1	.584**	.379**	.643**	.578**	.570**	.450**
Loss of Interest						1	.431**	.558**	.745**	576**	.672**
Appetite							1	.415**	.403**	.313**	.324**
Concentration								1	.562**	.576**	.399**
Guilt									1	.572**	.646**
Movement										1	.368**
Suicidal Ideation											1

Note. Alcohol-related problems = Alcohol Use Disorders Identification Test Subscale (Saunders et al., 1993); positive consequences = Positive Drinking Consequences Questionnaire (Corbin et al., 2008); sadness, sleep, fatigue, loss of appetite, concentration, guilt, movement, and suicidal ideation = Center for Epidemiological Studies of Depression Scale – Revised Subscales (Eaton et al., 2004).

* p < .05 ** p < .01 *** p < .001

Table 2

Multiple Linear Regression Analysis: Sadness Predicting Consequences of Alcohol Use

Predictors	R^2	Adj. R^2	β	ΔR^2	Δ F	df
Alcohol-Related Problems (AUDIT)						
Model 1: Age	.001	-.003	.030	.001	.260	1,285
Model 2: Sex	.002	-.005	-.027	.001	.197	1,284
Model 3: Sadness (CESD-R)	.101	.092	.318***	.100	31.459	1,283
Positive Consequences (PDCQ)						
Model 1: Age	.017	.013	-.128*	.017	4.767	1,284
Model 2: Sex	.017	.011	-.032	.001	.278	1,283
Model 3: Sadness (CESD-R)	.063	.053	.215***	.046	13.746	1,282

Note. Alcohol-related problems = Alcohol Use Disorders Identification Test Subscale

(Saunders et al., 1993); positive consequences = Positive Drinking Consequences Questionnaire

(Corbin et al., 2008); sadness = Center for Epidemiological Studies of Depression Scale –

Revised Subscale (Eaton et al., 2004).

* p < .05 ** p < .01 *** p < .001

Table 3

Multiple Linear Regression Analysis: Sleep Predicting Consequences of Alcohol Use

Predictors	R^2	Adj. R^2	β	ΔR^2	Δ F	df
Alcohol-Related Problems (AUDIT)						
Model 1: Age	.001	-.003	.030	.001	.260	1,285
Model 2: Sex	.002	-.005	-.027	.001	.197	1,284
Model 3: Sleep (CESD-R)	.077	.067	.275***	.075	22.973	1,283
Positive Consequences (PDCQ)						
Model 1: Age	.017	.013	-.128*	.017	4.767	1,284
Model 2: Sex	.017	.011	-.032	.001	.278	1,283
Model 3: Sleep (CESD-R)	.074	.064	.238***	.056	17.084	1,282

Note. Alcohol-related problems = Alcohol Use Disorders Identification Test Subscale

(Saunders et al., 1993); positive consequences = Positive Drinking Consequences Questionnaire

(Corbin et al., 2008); sleep = Center for Epidemiological Studies of Depression Scale – Revised

Subscale (Eaton et al., 2004).

* p < .05 ** p < .01 *** p < .001

Table 4

Multiple Linear Regression Analysis: Fatigue Predicting Consequences of Alcohol Use

Predictors	R^2	Adj. R^2	β	ΔR^2	Δ F	df
Alcohol-Related Problems (AUDIT)						
Model 1: Age	.001	-.003	.030	.001	.260	1,285
Model 2: Sex	.002	-.005	-.027	.001	.197	1,284
Model 3: Fatigue (CESD-R)	.091	.081	.301***	.089	27.771	1,283
Positive Consequences (PDCQ)						
Model 1: Age	.017	.013	-.128*	.017	4.767	1,284
Model 2: Sex	.017	.011	-.032	.001	.278	1,283
Model 3: Fatigue (CESD-R)	.075	.065	.242***	.058	17.61	1,282

Note. Alcohol-related problems = Alcohol Use Disorders Identification Test Subscale

(Saunders et al., 1993); positive consequences = Positive Drinking Consequences Questionnaire

(Corbin et al., 2008); fatigue = Center for Epidemiological Studies of Depression Scale –

Revised Subscale (Eaton et al., 2004).

* p < .05 ** p < .01 *** p < .001

Table 5

Multiple Linear Regression Analysis: Loss of Interest Predicting Consequences of Alcohol Use

Predictors	R^2	Adj. R^2	β	ΔR^2	ΔF	df
Alcohol-Related Problems (AUDIT)						
Model 1: Age	.001	-.003	.03	.001	.260	1,285
Model 2: Sex	.002	-.005	-.027	.001	.197	1,284
Model 3: Loss of Interest (CESD-R)	.048	.037	.216***	.046	13.647	1,283
Positive Consequences (PDCQ)						
Model 1: Age	.017	.013	-.128*	.017	4.767	1,284
Model 2: Sex	.017	.011	-.032	.001	.278	1,283
Model 3: Loss of Interest (CESD-R)	.035	.025	.135*	.018	5.260	1,282

Note. Alcohol-related problems = Alcohol Use Disorders Identification Test Subscale

(Saunders et al., 1993); positive consequences = Positive Drinking Consequences Questionnaire

(Corbin et al., 2008); loss of interest = Center for Epidemiological Studies of Depression Scale –

Revised Subscale (Eaton et al., 2004).

* p < .05 ** p < .01 *** p < .001

Table 6

Multiple Linear Regression Analysis: Appetite Predicting Consequences of Alcohol Use

Predictors	R^2	Adj. R^2	β	ΔR^2	ΔF	df
Alcohol-Related Problems (AUDIT)						
Model 1: Age	.001	-.003	.030	0.001	0.260	1,285
Model 2: Sex	.002	-.005	-.027	0.001	0.197	1,284
Model 3: Appetite (CESD-R)	.029	.018	.166**	0.027	7.914	1,283
Positive Consequences (PDCQ)						
Model 1: Age	.017	.013	-.128*	0.017	4.767	1,284
Model 2: Sex	.017	.011	-.032	0.001	0.278	1,283
Model 3: Appetite (CESD-R)	.044	.034	.165**	0.027	7.830	1,282

Note. Alcohol-related problems = Alcohol Use Disorders Identification Test Subscale
(Saunders et al., 1993); positive consequences = Positive Drinking Consequences Questionnaire
(Corbin et al., 2008); appetite = Center for Epidemiological Studies of Depression Scale –
Revised Subscale (Eaton et al., 2004).

* p < .05 ** p < .01 *** p < .001

Table 7

Multiple Linear Regression Analysis: Concentration Predicting Consequences of Alcohol Use

Predictors	R^2	Adj. R^2	β	ΔR^2	ΔF	df
Alcohol-Related Problems (AUDIT)						
Model 1: Age	.001	-.003	.030	.001	.260	1,285
Model 2: Sex	.002	-.005	-.027	.001	.197	1,284
Model 3: Concentration (CESD-R)	.143	.134	.377***	.141	46.716	1,283
Positive Consequences (PDCQ)						
Model 1: Age	.017	.013	-.128*	.017	4.767	1,284
Model 2: Sex	.017	.011	-.032	.001	.278	1,283
Model 3: Concentration (CESD-R)	.095	.086	.280***	.078	24.245	1,282

Note. Alcohol-related problems = Alcohol Use Disorders Identification Test Subscale

(Saunders et al., 1993); positive consequences = Positive Drinking Consequences Questionnaire

(Corbin et al., 2008); concentration = Center for Epidemiological Studies of Depression Scale –

Revised Subscale (Eaton et al., 2004).

* p < .05 ** p < .01 *** p < .001

Table 8

Multiple Linear Regression Analysis: Guilt Predicting Consequences of Alcohol Use

Predictors	R^2	Adj. R^2	β	ΔR^2	ΔF	df
Alcohol-Related Problems (AUDIT)						
Model 1: Age	.001	-.003	.030	.001	.260	1,285
Model 2: Sex	.002	-.005	-.027	.001	.197	1,284
Model 3: Guilt (CESD-R)	.100	.091	.315***	.099	31.082	1,283
Positive Consequences (PDCQ)						
Model 1: Age	.017	.013	-.128*	.017	4.767	1,284
Model 2: Sex	.017	.011	-.032	.001	.278	1,283
Model 3: Guilt (CESD-R)	.049	.039	.177**	.031	9.300	1,282

Note. Alcohol-related problems = Alcohol Use Disorders Identification Test Subscale

(Saunders et al., 1993); positive consequences = Positive Drinking Consequences Questionnaire

(Corbin et al., 2008); guilt = Center for Epidemiological Studies of Depression Scale – Revised

Subscale (Eaton et al., 2004).

* p < .05 ** p < .01 *** p < .001

Table 9

Multiple Linear Regression Analysis: Movement Predicting Consequences of Alcohol Use

Predictors	R^2	Adj. R^2	β	ΔR^2	ΔF	df
Alcohol-Related Problems (AUDIT)						
Model 1: Age	.001	-.003	.030	.001	.260	1,285
Model 2: Sex	.002	-.005	-.027	.001	.197	1,284
Model 3: Movement (CESD-R)	.055	.045	.231***	.053	16.003	1,283
Positive Consequences (PDCQ)						
Model 1: Age	.017	.013	-.128*	.017	4.767	1,284
Model 2: Sex	.017	.011	-.032	.001	.278	1,283
Model 3: Movement (CESD-R)	.074	.064	.239***	.057	17.317	1,282

Note. Alcohol-related problems = Alcohol Use Disorders Identification Test Subscale

(Saunders et al., 1993); positive consequences = Positive Drinking Consequences Questionnaire

(Corbin et al., 2008); movement = Center for Epidemiological Studies of Depression Scale –

Revised Subscale (Eaton et al., 2004).

* p < .05 ** p < .01 *** p < .001

Table 10

Multiple Linear Regression Analysis: Suicidal Ideation Predicting Consequences of Alcohol Use

Predictors	R^2	Adj. R^2	β	ΔR^2	ΔF	df
Negative Consequences (AUDIT)						
Model 1: Age	.001	-.003	.030	.001	.254	1,284
Model 2: Sex	.002	-.006	-.026	.001	.186	1,283
Model 3: Suicidal Ideation (CESD-R)	.023	.013	.147*	.021	6.165	1,282
Positive Consequences (PDCQ)						
Model 1: Age	.017	.013	-.129*	.017	4.799	1,283
Model 2: Sex	.018	.011	-.030	.001	.256	1,282
Model 3: Suicidal Ideation (CESD-R)	.030	.019	.111	.012	3.53	1,281

Note. Alcohol-related problems = Alcohol Use Disorders Identification Test Subscale

(Saunders et al., 1993); positive consequences = Positive Drinking Consequences Questionnaire

(Corbin et al., 2008); suicidal ideation = Center for Epidemiological Studies of Depression Scale

− Revised Subscale (Eaton et al., 2004).

* p < .05 ** p < .01 *** p < .001

Table 11

Multiple Linear Regression Analysis: Negative Consequences Predicting Depressive Symptoms

Predictors	R^2	Adj. R^2	β	ΔR^2	ΔF	df
Sadness						
Model 1: Age	.007	.003	-.083	.007	1.965	1,285
Model 2: Sex	.009	.002	.049	.002	.671	1,284
Model 3: Alcohol-Related Problems (AUDIT)	.108	.099	.315***	.099	31.459	1,283
Sleep						
Model 1: Age	.001	-.003	.025	.001	.177	1,285
Model 2: Sex	.012	.005	.107	.011	3.197	1,284
Model 3: Alcohol-Related Problems (AUDIT)	.086	.076	.273***	.074	22.973	1,283
Fatigue						
Model 1: Age	.005	.001	-.069	.005	1.381	1,285
Model 2: Sex	.018	.011	.115	.013	3.669	1,284
Model 3: Alcohol-Related Problems (AUDIT)	.105	.096	.297***	.088	27.771	1,283
Loss of Interest						
Model 1: Age	.006	.003	-.078	.006	1.735	1,285
Model 2: Sex	.013	.006	-.086	.007	2.061	1,284
Model 3: Alcohol-Related Problems (AUDIT)	.059	.049	.213***	.045	13.647	1,283
Appetite						
Model 1: Age	.016	.013	-.127*	.016	4.648	1,285
Model 2: Sex	.019	.013	-.060	.003	.994	1,284
Model 3: Alcohol-Related Problems (AUDIT)	.046	.036	.163**	.027	7.914	1,283
Concentration						
Model 1: Age	.001	-.002	-.033	.001	.304	1,285
Model 2: Sex	.005	-.002	.066	.004	1.207	1,284
Model 3: Alcohol-Related Problems (AUDIT)	.146	.137	.376***	.141	46.716	1,283
Guilt						
Model 1: Age	.000	-.003	.021	.000	.124	1,285
Model 2: Sex	.002	-.005	-.034	.001	.313	1,284
Model 3: Alcohol-Related Problems (AUDIT)	.100	.091	.315***	.099	31.082	1,283
Movement						
Model 1: Age	.000	-.003	.014	.000	.053	1,285
Model 2: Sex	.003	-.004	-.053	.003	.763	1,284
Model 3: Alcohol-Related Problems (AUDIT)	.056	.046	.231***	.053	16.003	1,283
Suicidal Ideation						
Model 1: Age	.009	.006	-.095	.009	2.593	1,284
Model 2: Sex	.010	.003	.038	.001	.406	1,283
Model 3: Alcohol-Related Problems (AUDIT)	.032	.021	.146*	.021	6.165	1,282

Note. Alcohol-related problems = Alcohol Use Disorders Identification Test Subscale

(Saunders et al., 1993); sadness, sleep, fatigue, loss of appetite, concentration, guilt, movement,

and suicidal ideation = Center for Epidemiological Studies of Depression Scale – Revised

Subscales (Eaton et al., 2004).

* p < .05 ** p < .01 *** p < .001

Table 12

Multiple Linear Regression Analysis: Positive Consequences Predicting Depressive Symptoms

Predictors	R^2	Adj. R^2	β	ΔR^2	ΔF	df
Sadness						
Model 1: Age	.006	.002	-.077	.006	1.704	1,284
Model 2: Sex	.008	.001	.047	.002	.602	1,283
Model 3: Positive Consequences (PDCQ)	.054	.044	.217***	.046	13.746	1,282
Sleep						
Model 1: Age	.001	-.003	.028	.001	.216	1,284
Model 2: Sex	.012	.005	.106	.011	3.108	1,283
Model 3: Positive Consequences (PDCQ)	.068	.058	.240***	.056	17.084	1,282
Fatigue						
Model 1: Age	.004	.001	-.067	.004	1.283	1,284
Model 2: Sex	.017	.010	.114	.013	3.622	1,283
Model 3: Positive Consequences (PDCQ)	.075	.065	.242***	.058	17.610	1,282
Loss of Interest						
Model 1: Age	.005	.002	-.074	.005	1.560	1,284
Model 2: Sex	.013	.006	-.088	.008	2.156	1,283
Model 3: Positive Consequences (PDCQ)	.031	.021	.136***	.018	5.260	1,282
Appetite						
Model 1: Age	.017	.013	-.130*	.017	4.889	1,284
Model 2: Sex	.020	.013	-.057	.003	.907	1,283
Model 3: Positive Consequences (PDCQ)	.047	.036	.164**	.026	7.830	1,282
Concentration						
Model 1: Age	.001	-.003	-.025	.001	.176	1,284
Model 2: Sex	.004	-.003	.062	.004	1.060	1,283
Model 3: Positive Consequences (PDCQ)	.083	.073	.283***	.079	24.245	1,282
Guilt						
Model 1: Age	.001	-.003	.026	.001	.195	1,284
Model 2: Sex	.002	-.005	-.037	.001	.378	1,283
Model 3: Positive Consequences (PDCQ)	.034	.024	.180**	.032	9.300	1,282
Movement						
Model 1: Age	.000	-.003	.008	.000	.018	1,284
Model 2: Sex	.002	-.005	-.050	.002	.676	1,283
Model 3: Positive Consequences (PDCQ)	.060	.050	.242***	.058	17.317	1,282
Suicidal Ideation						
Model 1: Age	.009	.005	-.094	.009	2.500	1,283
Model 2: Sex	.010	.003	.038	.001	.401	1,282
Model 3: Positive Consequences (PDCQ)	.022	.012	.112	.012	3.530	1,281

Note. Positive consequences = Positive Drinking Consequences Questionnaire (Corbin et al.,

2008); sadness, sleep, fatigue, loss of appetite, concentration, guilt, movement, and suicidal

ideation = Center for Epidemiological Studies of Depression Scale – Revised Subscales (Eaton et

al., 2004).

* p < .05 ** p < .01 *** p < .001